November, 2010 Winter Weather Workshops

Mike York (Forecaster / Winter Weather Program Leader)

IMPACT-BASED WINTER WEATHER WARNING METHODOLOGY

Conventional Warning Criteria:

- 4" of snow in 12 hours or less
- 6" of snow in 24 hours or less

No other factors are accounted for, such as:

- Wind
- Pavement temperature
- Traffic volume (rush hour)

Bottom line:

- The impact of the winter event depends on more than just the amount.

1. Wind
2. Temperatures
3. Traffic volume
4. Rate of snowfall

All play a role

National Weather Service Directive 10-513

- "The forecaster has the discretion and should not be held back from issuing what best mitigates the impending winter hazard even if criteria may not be met in the strictest sense."

NWS Paducah policy change…

- Experimentation with impact-based ADVISORIES begins this winter

Previous criteria: 2-3" of snow

New criteria: Any snowfall that creates widespread hazardous conditions

So why not implement impact-based WARNINGS now?

1. The public needs to be educated / notified before warning criteria are changed, similar to when hail criteria changed to 1" .
2. Incorporating social science into forecasting is no small task.

Other challenges:

- How does one measure the "accuracy" of impact-based warnings? How do we know how we're doing?
  - Can or should we attempt to measure impacts objectively (e.g. accident rate data)?

Collaboration Issues…

- National watch/warning/advisory maps should not have a "patchwork" appearance
- NWS credibility suffers when maps show no logic to placement of warnings/advisories
- NWS forecasters must share a common baseline for defining an "impact-based warning"

What is a warning event?

- Can we arrive at a common baseline of what constitutes an "impact-based warning" event?
- We all perceive the same event differently, depending on how we were impacted.
- Varies by region of the country, by the amount of travelling you do, by the industry you are in, by your perception…

Good impact-based WARNING?

- Let's say 3" of snow falls in 2 hours
- Winds are gusting over 30 mph
- Drifts are a foot deep
- Salt is rendered less effective by cold temps
- It all happens around 4 P.M. on a weekday

????

Strictly following conventional criteria:

- Only an ADVISORY would be issued
- Advisory is issued for accumulations of less than 4 inches but more than 1 inch

Ice (freezing rain)

- Conventional warning criteria is ¼ inch

  Threshold for power line/ tree damage

Photo from Norm Bredenkamp
Wabash Valley,
Jan. 25, 2004

Example: December 23, 2008

- Light Freezing Rain - Less than one tenth inch
- Purchase Parkway in western Kentucky came to a standstill
- Hundreds of cars, trucks, and even snow plows and police cars slid off road regionwide
- BUT ¼ inch of ice is needed for a warning!

On the other hand:

- What if 4 inches of wet snow falls and
- Pavement remains above freezing…only slushy spots and
- Occurs on a weekend morning

Feb. 5, 2004
Near Paducah, KY
NWS Photo

Answer:

- Still a WINTER STORM WARNING… the same product that is issued for near blizzard conditions (such as December, 2004 pre-Christmas storm).

Photo: Charlie Kiesel,
Fort Branch, IN, Dec '04

In Summary…

- NWS Paducah will issue impact-based advisories this winter.
- Impact-based warning policy will be developed after evaluation of the new advisory policy.

Interim solution:

- NWS Paducah will use *enhanced wording* in advisories to convey warning-type impacts.
- For marginal warning events, mitigating factors will be emphasized in the warning.

What is your opinion?

- The impact-based warning philosophy is customer-driven. You are the customer.
- The challenge is how to implement it, not whether to implement it.
- Your input is needed. Tell us what you think. Mike.york@noaa.gov